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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/754,366	01/08/2004	Heng Liu	101109.0004US	7612
32605	7590	09/20/2005	EXAMINER	
MACPHERSON KWOK CHEN & HEID LLP 1762 TECHNOLOGY DRIVE, SUITE 226 SAN JOSE, CA 95110			NGUYEN, TUAN H	
			ART UNIT	PAPER NUMBER
			2813	
DATE MAILED: 09/20/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/754,366	Applicant(s) LIU, HENG	
	Examiner Tuan H. Nguyen	Art Unit 2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 July 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-53 is/are pending in the application.
- 4a) Of the above claim(s) 1-24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 25-53 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>3/11/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Applicant's election of Group I, claims 25-53 in the reply filed on 7/8/05 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 25-34, 37-43, 45-46, 49-53 are rejected under 35 U.S.C. 102(e) as being anticipated by Chen (U.S. Pat. No. 6,797,987).

See Chen, figs. 6A-6C and text on col. 4-6 which discloses the claimed LED comprising a light emitting device 1000 having a heat generating region and a heat conductive substrate 125 to which the heat generating region 1000 is directly bonded (figs. 6A-6B), so as to define a composite structure and so as to substantially enhance heat dissipation from the light emitting device (fig. 6C).

With respect to claims 27-33, fig. 6A shows the conventional AlGaInP LED wherein the heat generating region comprises a transparent substrate 114, an active layer 106, an n-doped layer 104, an p-doped layer 108, a reflector layer 116, and metal bonding layer 119, 124, and the heat conductive substrate 125 comprises a silicon layer 120 and a metal bonding layer 124 (fig. 6C, col. 4, line 15 to col. 6, line 22).

With respect to claim 34, col. 6, lines 9-25 discloses that the metal bonding layer could be formed on layer 119 before bonding.

With respect to claim 37, see col. 5, lines 26-31.

With respect to claims 38-40, see col. 1, lines 14-30 for a well-known AlGaInP LED having a double heterojunction.

With respect to claims 41-42, see fig. 6C, and text on col. 4, last two paragraphs for the electrode of P-type semiconductor layer 110 formed upon the composite structure.

With respect to claim 43, see col. 5, lines 39-40.

With respect to claim 46, see fig. 6C, n-type electrode 130.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 35, 36, 44, 47, 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen as applied to claims 25-34, 37-43, 45-53 above, and further in view of Background of the invention.

Chen, figs. 6A-6C and related text as explained above teaches substantially the claimed LED except a plurality of LEDs are bonded to a single heat conductive substrate, the metal bonding layer is selected from group consisting of Ni, Pt, Au, and Ti, and passivation layer, and negative and positive bonding pads formed upon the composite device.

The admitted prior art as disclosed in the Background of the invention, particularly in the reference to Bhat et al., fig. 22 and related text on col. 15 discloses the plurality of LEDs on the same heat conductive substrate.

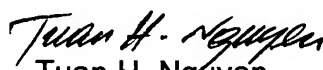
It would have been obvious to one having ordinary skill in the art at the time the invention was made to have form a plurality of LEDs on the same heat conductive substrate as suggested by Bhat et al. in Chen's device to achieve high element densities in a limited space, and high power illumination. It would have been also obvious to those skilled in the art to use well-known metal material as suggested by Chen (col. 5, lines 64-67) for bonding layer 124, and forming passivation layer and bonding pads for encapsulating and wired bonding to the final device structure.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Chen'677 discloses package of flip-chip LED with heat conductive base substrate; Ho also discloses a LED with heat dissipating structure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan H. Nguyen whose telephone number is 571-272-1694. The examiner can normally be reached on 9AM-5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr. can be reached on 571-272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Tuan H. Nguyen
Primary Examiner
Art Unit 2813